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ABSTRACT

This statistical analysis of questionnaire data from a study of 673 third, fifth and seventh grade children and their parents was made to identify individual independent variables associated with children's total amount of television viewing. The data were analyzed by the stepwise linear regression method. The theoretical model guiding the analysis consisted of four broad elements: parents' and children's value systems, parent-child interaction, parents' TV viewing behavior and child's demographics. The variables in the data particularized the broad constructs. Findings indicated that all four components of the pre-specified model derived from socialization theory contributed to the children's television viewing behavior. The components and their share of the explained variances are: the child's own value systems (31%); child's own demographics (29%); parent-child interactions (20%); and parent's own TV behavior (20%). In terms of the individual variables studied, it was found that there is a positive relationship between a child's concern for her health and well being and her volume of television viewing. Analysis of the data within and across age groups argues against a simple hypothesis of the cumulative effects of television exposure upon children's anxiety although hostility or detachment towards the parent is associated with heavy viewing behavior. Both TV volume and illness anxiety decrease with age. However, children's anxiety contributes most heavily to the "explained variance" of television viewing among the seventh grade children. (Author/RH)

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TELEVISION AS A DEPENDENT VARIABLE, FOR A CHANGE

A Paper Given by Seymour Banks* and Rajinder Gupta*

at the American Psychological Ass'n Annual Convention

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Television As A Dependent Variable, For A Change

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Introduction and Acknowledgement

This paper is an example of the application of the principles of conservation and recycling to research. The original body of data was collected by Prof. Thomas S. Robertson, John R. Rossiter and Terry C. Gleason of The Wharton School, University of Pennsylvania, under a grant from the National Science Foundation to assess the effect of televised proprietary or OTC drug advertising on children. (See Robertson, Rossiter, and Gleason 1978, 1979 for their reports on their own findings.) Subsequently, Prof. Robertson gave us a complete copy of their entire respondent-by-respondent data file so we might study the effect of various factors on children's volume of television viewing. We recognize that we are treating age cross-sectional data as if they were longitudinal in nature; also in choosing television viewing as a dependent variable, we are going against the current tradition of treating television (or television advertising) as an exogenous or independent variable. In a non-experimental world, designation of variables as independent and dependent rests upon theoretical bases. Our work has guided by the use and gratification approach to media usage; studies of this genre among children antedate by far the Surgeon General's Report on Television and Social Behavior (Comstock et al 1978).

Method

The data come from interviews of 673 children and their parents (usually the mother; occasionally a guardian). The children filled out questionnaires in

their own classrooms while their mothers were interviewed by telephone on a parallel questionnaire. The sample was drawn from 6 school districts, all drawn from the city of Philadelphia and its nearby environs; each school district provided a selection of schools representing one or more socio-economic districts. The social class breakdown of the sample was: upper middle class, 14%; lower-middle class, 31%; working class, 34%; disadvantaged, 21%. The children were selected in approximately equal numbers from the third, fifth and seventh grades, (ages range from 8 to 13); boys and girls are equally represented at each grade level.

We concentrated on four sets of variables collected by Robertson, Rossiter, and Gleason:

1. Television viewing behavior as measured by reported frequency of viewing the last four telecasts of 35 programs randomly selected within three dayparts. In addition to their own viewing, each respondent was asked whether they viewed each program with the other member of the child-parent dyad.

2. Systems of medicine values - belief in the efficacy of proprietary medicines, affect toward taking them, and intent to take such medicines.

3. Parent-child interactions of two types - one having to do with discussions between parent and child about medicine or requests by the child for specific medicines; the other dealing with the general atmosphere or style of family interactions. In addition, a five question scale evaluated the parent's degree of television control.

4. Demographics of the parent and the child.

A discussion of Robertson', Rossiter', and Gleason's systems of medical values and parental/child interaction scales is found in the appendix to this paper.

Robertson, Rossiter and Gleason tested for children's possible yea-saying bias and validity of response by including 3 fake shows to their list of 35 programs; they found a very low incidence of fake show claiming. All of their variables were tested for internal consistency via Cronbach's alpha; it was found that the reliabilities for the children's data were much higher than for the parents' own reports and, in general, were above acceptable levels (0.7 or so); however, one variable was dropped for unsatisfactory levels of alpha. The alpha of the children's yea-saying bias was .07 indicating a lack of such bias.

The data were analyzed by stepwise linear regression because we were interested in the development of a structural relation between our dependent variable (television viewing volume or co-viewing) and the different types of independent variables, not just a measure of canonical correlation, (Levine 1977).

Theoretical Basis

Figure A sketches out the fundamental model guiding our analysis; it was pre-specified and derives from the literature of children's socialization (Comstock, Chaffee et al 1978; Ward, Wackman and Wartella 1977). We must say at the outset that we are interested in Robertson et al's materials only as illustrative of the model, rather than in their own right. Or to put the same concept in other words, we are interested in their data's latent rather than manifest content. This model places the child within

the context of her/his family and thus raises the subject of parent-child influence, somecimes discussed as the socialization process. The common sense view of the socialization process is that the parent is the dominant element of this dyad and the child comes to adopt parental attitudes and usage patterns; this can be described as The Correspondence Model. However some new evidence from the fields of sociology (Skolnick 1978) and cognitive development (Gelman 1978) suggest a contrasting concept, The Independence Model.

Discussion of Results

In terms of our general model, we found that each of the four components of figure A contribute importantly to the "explained" variance of children's total volume of television viewing. We are adopting the convention of putting "explained" between quotation marks to signify our appreciation of the fact that we are measuring association, not causality. The parent-child interaction component of our model and children's demographics were roughly equal in importance and together accounting for 3/5 of the "explained" variance. The remaining 40% of "explained" variance was split evenly between parents' own television viewing volume and the medical values component of the model.

It is useful both in their own right and as support of the two alternative models of the parent-child influence, or consumer socialization process, to examine the "contribution" of individual independent variables to the "explained" sum of squares of children's total volume of television viewing. Incidentally, our criterion for including variables in a structural equation of our various television viewing variables was that we included only those variables whose regression coefficients had t values of 2 or more; i.e. they were "significant" at the 5% level.

Table 1

Strength and Direction of Variables Upon
Children's Total Volume of Television Viewing
(Adj. R^2 = .3505)

Variable Name	Strength	Direction
Grade	20.8%	Negative
Parents' TV Volume	19.5	Positive
Child specific mediation (CSM)	17.1	Positive
Child's med. req. behavior (CMRB)	9.2	Positive
Child's illness anxiety (CIA)	8.4	Positive*
Child's hostile/detached attitude toward parents (CHD)	6.3	Positive
Child's attitudes toward other's use of medication (CV)	6.1	Positive*
No. of working sets in home	5.4	Positive
Parents' illness anxiety (TPIA)	4.1	Positive*
No. of children in family	3.1	Positive
	100.0%	

In these situations (*), the scales were coded so that the higher the score the more the child is opposed to frequent use of medication; so when these scales were assigned negative coefficients, one must interpret the findings positively.

The influence of grade on children's television viewing can be seen easily from the fact that the mean amounts of reported or claimed viewing per day were 5.0, 3.9 and 3.2 hours, for children in the 3rd, 5th and 7th grades, respectively. (These are the raw amounts of reported viewing of the 35 sample programs and are of the proper order of magnitude.) It can be seen that approximately half of the "explained" variance of total television volume is accounted for by the various attitudinal scales, most of which are derived from children's data rather than parents', even though both sets were submitted at the same time. Both the content and direction of the selected scales suggest that there is a positive relationship between a child's concern about her or his health and well being and her volume of

television viewing. Illness anxiety has been shown to correlate substantially with general anxiety (Brodie 1974). An indication of the possibility that some generalized anxiety syndrome or sense of alienation underlie our results comes from the fact that the family interaction style selected for the equation is one which evaluates each child on the basis of a hostile/detached attitude toward his parent, rejecting those expressing more favorable attitudes. Since sex was found to have no effect on volume of TV viewing, the fact that these findings apply equally to girls and boys is indicated by our subsequent alternate use of the third person pronouns.

Further support for the concept of a generalized anxiety syndrome arises from an examination of the fine grain detail of the "explained" variance shown in table 1. Contributions to explained sums of squares arise in two ways: direct and indirect effects. Indirect effects arise when there are intercorrelations among the so-called independent variables (Ferber, 1949). There is a general tendency for a variable's ratio of direct to total explained variance to decrease as its share of total explained variance decreases. However, the attitudinal variables: children's and parents' illness anxiety (CIA and TPIA) and children's medication values (CV), and children's medication request frequency (CMRB) generate their contributions to explained variance predominantly through indirect effects while the objectively measured variables of the same power level (number of sets in working order and number of children) make their contributions predominantly through direct effects. Thus, this pattern of diffused or indirect contribution to explained variance by attitudinal variables is supportive of the concept of a generalized anxiety syndrome that arose previously from an evaluation of the subject matter of the selected scales.

Turning now to socialization theory, the data in table 1 appear to offer support for both models. However, we feel that the general thrust of these findings supports the Independence Model even though parents' TV volume has a strongly positive relationship with children's own viewing. The basic assumption of the Independence Model is that each child is free to accept or reject parental attitudes and behavior. Thus agreement with parents on one or two variables out of a large set does not weaken the overall argument since five other independent variables show no association between parental data and a child's own volume of TV viewing; the children's own data dominate table 1.

Robertson, Rossiter, and Gleason also found that their data on children's attitudes toward and usage of proprietary medicines support the Independence Model. Their results indicated that parent-child communication frequency about illness and medication contributed positively to children's attitudes and usage of OTC drugs; however, there was little or no relationship between a child and her parent's medicine attitudes and usage. They suggest that such discussions raise the salience of the subject without imparting any degree of correspondence in parent and child viewpoints (1978, ch. 6).

It is interesting to note in table 1 that the two measures of parent-child medicine discussion frequency (CSM and CMRB) "explain" almost twice as much variance in television viewing than does the child's index scores on illness anxiety and on the use of medication by others. This was so unexpected that we decided to treat CSM and CMRB as dependent variables. The results are shown in table 2.

Table 2

Structural Equations of Frequency of 2 Parent-Child Medication Interaction Processes
(Results expressed as % of "explained" variance)

Symptom-Specific Discussion of Medicines (CSM)		Child's Medicine Requesting Behavior (CMRB)	
TPSM	28%	Grade	61%
CDC	26	CDC	12
TPIA	21	CAI	9
CACC	18	TPIA	8
CHD	7	TPSM	6
		TPB	4
Totals	100%		100%
Adj. R^2	0.1037		0.1559

Because these R^2 are quite small, one must be cautious about the conclusions drawn from these results. Nevertheless, we believe it quite indicative that in the CSM equation, the two friendly/democratic family interaction scales (CDC and CACC) account for 6 times as much "explained" variance than the one hostile measure (CHD). The CMRB equation is dominated by Grade but again, two friendly/democratic family interaction scales are fairly strong while no index of hostile interaction appears.

Given the presence of the parental illness anxiety index in both equations, it appears to us that conversation within a household about a given subject is a function of both interest in that subject by the parent and the presence of a discussion-promoting family-interaction style. Cliché, you say; true, but it is nice to find such easily acceptable findings at the end of massive print-outs.

After this digression, let us return to the subject of children's volume of television viewing. Saturday and Sunday weekend children's programs continue to be the focus of regulatory effort. Our analysis indicates that

children's volume of viewing such programs has a somewhat different structural model than that shown in table 1; half of the "explained" variance is associated with the parent-child interaction component of the model (see table 3).

Grade, however, is the most "important" single variable, having a strongly negative "effect" on viewing. The two specific medication discussion variables (CSM and CMRB) have about the same "influence" on a child's viewing of this segment of TV programs as they did on her total volume of viewing; parental TV volume drops in "importance" while the variable indicating a child's hostility/alienation (CHD) toward his parent rises in importance. The fact that the contribution of this last-named variable to the "explained" sum of squares is twice as great for the weekend daytime programs as for total volume is taken as further support for the hypothesis that a child's television consumption is affected by an anxiety syndrome.

Table 3

Structural Equation of a Child's Weekend Television Viewing Volume
Breakdowns of "explained" variance

By Model Component			By Individual Variables	
Medical Value Systems		6%	Grade	30.4%
Child's data	-		CSM	25.7
Parent's data	6		CHD	12.6
Parent-child interactions		50	CMRB	11.8
Medical	38		PTvE	8.6
Non-medical	12		TPIA	5.9
Parent's own viewing volume		9	No. of sets	5.0
Child's Demos		35		
Grade	30			
No. of sets	5			
		100%		100.0%

Adj. R^2 = .2148

Basically the same pattern of factors found to affect a child's total volume of television viewing also affect his or her likelihood of co-viewing with a parent. However, for this form of television behavior, the importance of the parent's own volume of television viewing and of parent-child interactions are increased; the contribution of the medical value systems component to "explained" variance is cut almost in half. Thus, the results on co-viewing appear to be much more compatible with the stereotype of parent-child sharing and caring.

We have not reported the statistical significance of our regression results since we have assumed that the reader would realize that our reported R^2's were evaluated by F ratios with over 600 degrees of freedom for the error term; hence were associated with probabilities far smaller than the standard 5 and 1% alpha levels. It is perhaps more to the point to report that when we re-ran the regressions on children's total viewing, weekend viewing and co-viewing discussed above among randomly split halves of our sample, over 90 per cent of the "explained" variance in each of the six runs was associated with the variables shown in tables 1 and 3 or described in the preceding paragraph; also rank orderings of variables across sample halves were quite similar.

Implications

It is classic to state, after discussing a piece of research, that further research is necessary but we can draw no other conclusion from our work. We are aware that we are working with associated data from children of different ages; on the other hand, the relevant policy data are developmental or longitudinal in nature. The current research tradition treats

television as an independent variable (often as the independent variable and other data as dependent variables). This spirit permeates the excellent recent compendium of the entire scientific literature on television which is exemplified by its title Television and Human Behavior (Comstock, Chaffee, et al., 1978). Other examples of this game is found in the work by Dean George Gerbner (Gerbner and Gross, 1976 and Gerbner et al., 1977) and of course, Robertson, Rossiter and Gleason's work. In the laboratory films and video tapes serve admirably as experimental stimuli; however, in the real world of free choice of media usage, the matter is by no means so clear. The uses and gratification approach to studies of media consumption far antedates the work of Bandura and other experimenters and the Surgeon General's Report on Television and Social Behavior.

One means of approximating the developmental approach is to look at our data within each age group. However, before discussing the results of our analysis of viewing volume by grade level, it is important to point out two age-related phenomena uncovered by Robertson, Rossiter and Gleason (1978):

1. Viewing volume decreases with age.
2. Illness anxiety decreases with age.

Among third grade children, the combination of parental and sibling viewing or opportunity "accounts" for 50% of "explained" variance; the balance is generated by measures concerning medicine attitudes and discussions and on the hostile/alienated attitude of a child toward her parent. Among the lighter viewing and less anxious seventh graders, illness anxiety becomes the "dominant" variable; in fact, the general anxiety syndrome (combining illness anxiety, medicine discussion and hostile attitudes toward a parent)

"explains" three quarters of the variance in children's viewing volume. The fifth grade children exhibit an intermediate pattern.

Table 4

Structural Equations of a Child's Total TV Volume
By Grade Level
Breakdowns of Explained Variance

	3rd Grade	5th Grade	7th Grade
CSM	36%	20%	14%
CMRB	-	-	17
PTvE	22	42	26
No. of Children in Family	12	-	-
CV	11	-	-
CREJ	10	-	-
No. of Working Sets in Home	9	-	-
TPIA	-	18	-
CHD	-	12	-
CB	-	8	-
CIA	-	-	43
Totals	100%	100%	100%
Adj. R^2	.2993	.2731	.2327

Glossary - (First or second letter designates respondent: C = child, P = parent)

CSM: Symptom-specific mediation frequency
CMRB: Medicine-requesting behavior
PTvE: Parent's own television exposure volume
CREJ: Rejection of parental control
CV: Values toward medicine taking by "people"
TPIA: Parental illness anxiety
CIA: Child's illness anxiety
CB: Child's belief in the efficacy of medicine
CHD: Hostile detachment

The combination of Robertson, Rossiter and Gleason's and our findings, in our opinion, argue against a simple hypothesis of cumulative effect of television exposure upon children's anxiety level. Among 3rd graders, half of the "explained" variance of viewing volume is associated with anxiety; then as one looks at the older children, the overall anxiety level (and viewing volume) decreases while the contribution of anxiety to viewing volume increases.

An early study by Eleanor Maccoby is applicable here. Following the uses and gratification approach to media consumption, she attempted to discover whether highly frustrated kindergarten-age children sought escape in television by watching more than the less frustrated ones. She found that frustration was associated with greater television viewing among lower class children (Maccoby, 1954). She attributed the class difference to the fact that the lower class parents watched more television than the upper-middle class parents. However, we would explain it by saying that, although parental example is important, the child's own internal states are also important. Such findings with kindergartners counterargue against the concept of television being the stimulus to anxiety in a simple S-R model. Incidentally we discovered this paper only after we had arrived at the general thesis of this paper.

Let us close by pointing out that, despite our work, we are left with two questions: One deals with a better understanding of the underlying model of children's television viewing - do we have a S-R model (called variously the hypodermic-needle or the silver bullet model), or do we have a model of active media consumers, seeking out the stimuli they wish and attending to and perceiving them selectively (Pick, Frankel, and Hess, 1975)? Assuming some initiative on the part of children in determining their own patterns of media consumption, we must seek to determine the causes, or at least good predictors, of such consumption. The findings discussed above indicate that child's volume of television viewing is affected by both external and internal forces. The external forces are parental and sibling behavior and the opportunity for viewing as a function of the number of working sets in the home. The child's own internal data are quite important; but we

do not know the best way to identify the most relevant internal states: we have used illness anxiety and attitudes towards parents as an indication of a generalized anxiety syndrome. Other broad attitudinal systems are available for consideration in Lyle and Hoffman (1972), Noble (1975), Schramm, Lyle and Parker (1961) or in life-style research.

COMPONENTS OF MODEL AFFECTING A CHILD'S TELEVISION BEHAVIOR

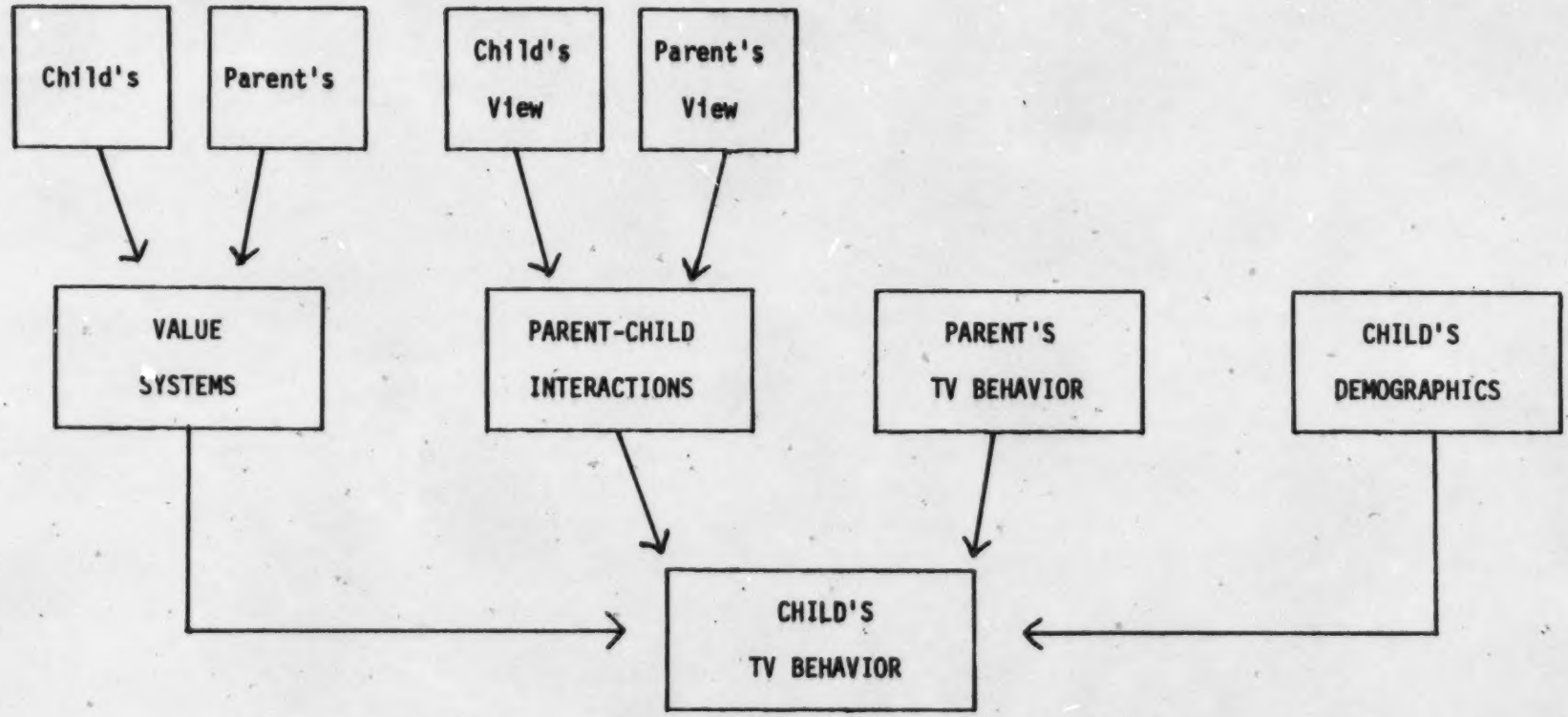

Figure A

APPENDIX

IDENTIFICATION AND ILLUSTRATIVE OPERATIONAL DEFINITION OF INDEPENDENT VARIABLES BY MODEL COMPONENT AND SOURCE

Value Systems

Data from child's questionnaire

CPI - Child's estimate of population incidence of aches/pains/symptoms
"How many times a month do people get headaches?"

CI - Child's intent to use OTC's
"When I have a headache, I want to take aspirin."

CB - Child's belief in the efficacy of OTC's
"When I have a cold, cold medicine can help me feel better."

CIA - Child's own illness anxiety
"I worry a lot about getting sick."

CV - Child's attitudes towards others' OTC usage
"When people feel a little sick, they should take medicine."

CA - Child's own affect toward medicine taking
"When I have a cold, I like to take cold medicine."

Data from parent's questionnaire

TPPI - Parent's estimate of population incidence of aches/pains/symptoms
"How many times a month do people get headaches?"

TPI - Parent's own intent of taking OTC's
"When you have a headache, do you want to take aspirin?"

TPB - Parent's own belief in the efficacy of OTC's
"When I have a cold, cold medicine can help me feel better.

TPIA - Parent's own illness anxiety
"I worry a lot about getting sick."

TPV - Parent's own attitudes toward others' OTC usage
"People take medicines too often."

TPA - Parent's own affect toward medicine taking
"When I have a cold, I like to take cold medicine."

Parent-child interaction

Data from child's questionnaire

CAI - Acceptance of individuation
"My parents allow me to tell them if I think my ideas are better than theirs."

CREJ - Rejection of parental control
"My parents are always getting after me."

CACC - Acceptance of parents
"My parents enjoy going on drives, trips or visits with me."

CHD - Hostile detachment
"My parents think I am just some one to 'put up with'."

CDC - Democration communction
"My parents say that my ideas are important and that I should explain them even if people don't like them."

CSM - Specific mediation
"Since school started in September, how many times have you and your parents talked about which medicines work the best?"

CFIS - Child's description of family interaction style
(Sum of CAI, DREJ, CACC, CHD, CDC)

CTVC - Child's appraisal of parent's television controls
"Do your parents tell you that you have to finish your homework before you can watch TV?"

CMC - Child's appraisal of parent's medicine controls
"Do your parents let you take cold medicine without asking them?"

CMRB - Child's medicine requesting behavior
"When I have a cold, I ask my parents for cold medicine."

Data from parent's questionnaire

TPSM - Parent's specific mediation
"Since school started in September, how many times have you and _____ talked about which medicines work the best?"

TPTVC - Parent's TV Control
"Do you tell your children that he/she has to finish his/her homework before he/she can watch TV?"

TPSCMC- Parent's supervision of child's medicine consumption
"Do you let your son/daughter take cold medicine without asking you?"

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